dates must be medical students of not less than eight terms' standing. The value of the scholarships is 55*l.* a year for two or three years. Applications are to be made to the tutors by March 1.

M. GERNEZ, *maître de conferences* at the Paris Normal School, has been nominated director of the chemical research laboratory, in succession to the late M. Joly.

PROF. FRANK CLOWES has been elected Emeritus Professor of Chemistry in the University College, Nottingham, on accepting the position of chief chemist and chemical adviser to the London County Council. He will thus retain his professorial title and status, though no longer performing professorial duties. The following is the resolution of the College Committee:—"Resolved that in recognition of the valuable services rendered to the College by Prof. Clowes, first in organising the Chemical Department, and afterwards for sixteen years discharging the duties of Chemical Professor, and for three years the duties of Principal, an honorary position of Emeritus Professor of this College be conferred upon him."

THE Somerset County Education Committee assists technical education in the county in a number of ways, but no branch of its work is likely to prove of more permanent value than the system of aids to public secondary schools, for the purposes of securing efficient teaching of scientific and technical subjects. These grants usually take the form of capitation grants, with the provision that, if made at all, the minimum amount will be 100*l.* per annum. Schools receiving the grants are open at all times, without previous notice, to inspection by Mr. C. H. Bothamley—the Director of Technical Instruction—or other officer appointed for the purpose by the County Committee. It is satisfactory to find that the increased efficiency of the schools which has resulted from the aid and supervision of the County Committee has led in several instances to a marked increase in the number of pupils attending them. In addition to annual grants the Committee has aided schools by grants for building and equipment. There are, however, still considerable areas of the county in which a supply of efficient secondary education is almost entirely wanting. But the report of the County Committee points out that until local authorities receive the wider powers which it is hoped may be given to it by a Secondary Education Act, it will be almost impossible to provide for boys and girls that adequate supply of secondary education of a modern type, which, it cannot be too often repeated, is the only foundation on which it is possible to rear a system of higher technical education such as will bring the higher sections of the industrial community in this country up to the same level of knowledge of their work as their competitors in foreign countries. It is also now becoming generally recognised that secondary education of the kind referred to is rapidly becoming indispensable to every one who desires to occupy a position of control and responsibility in his particular calling in life, whether he afterwards endeavours to add any higher technical training to his general education or not. The Somerset Committee fully recognise this educational principle, and their report shows that they act upon it so far as teey are able.

SCHOOLS of Science carried on in connection with the Department of Science and Art are schools in which systematic courses of instruction are followed. When these conditions are fulfilled, and a fair proportion of students take advanced courses, a special grant is made to the schools in addition to the ordinary grants. Recently, the Inspectors of the Department were given instructions to report on all cases of Schools of Science where the students leaving at the end of the first year, or at the end of the second year, exceeded twenty-five per cent., the idea being that such schools had no claim to be recognised as true Schools of Science, for a sufficient proportion of the students did not continue the systematic course of work laid down. This action of the Department has met with considerable opposition from teachers and school authorities who wish to obtain the special grant without being qualified for it. Numerous schools which do not fulfil, and never expect to fulfil, one of the essential conditions upon which the institution of a special grant to Schools of Science was originally approved, are yet claiming the special grant for such schools instead of the ordinary grant. The Department has now issued a second memorandum stating that it is not desired to press unduly, by any hard and fast rule of percentage, on those schools which may, if time be allowed them, establish themselves as Schools of Science, when it is clear that there is a *boná fide* effort to make them such. More than this cannot very well be conceded, for grants can be earned for instruction in any ordinary science or art school or class, without the creation of a School of Science, in the same form as in a School of Science, *i.e.* on attendance. These grants are large, though not on so high a scale as in a School of Science. The Departmental Circular points out that the only justification of a grant higher than the ordinary one is that the school which receives it should fulfil conditions which are not required from ordinary schools and classes. Whether the conditions required should be in any way modified can only be properly considered when the information called for by the Department has been obtained.

SCIENTIFIC SERIALS.

Bulletin of the American Mathematical Society, December 1897.—In accordance with the amended by-laws of the Society (May 29, 1897), by which it was arranged that four New York meetings annually should be held instead of eight, as previously, viz. on the last Saturdays of October, February and April, and an annual meeting in the last week of December, a meeting was held on October 30. The object of the change is to secure greater prominence and interest for each meeting, and to afford the members of the Society a better opportunity for scientific and social intercourse. Each meeting now extends through two sessions, held in the morning and afternoon. Forty-one persons (thirty-seven members) were present, and this after the recent successful meeting at Toronto. Nine papers were read, of which abstracts are given here. Some of the papers are printed in the present number, and others will be published in journals whose titles are given.—Note on hyper-elliptic integrals, by Prof. A. S. Chessin, is one of the papers. If X_r is a polynomial in x of degree r; and $P_m(x)$, $Q_n(x)_1$ . . . polynomials in x of degrees m, n, . . . , we know that the integration of

$$\int f(x, \sqrt{X_r})dx,$$

where

$$f(x, \sqrt{X_r})$$

is a rational function of x and $\sqrt{X_r}$, is reduced to the integration of

$$\int \frac{R(x)dx}{\sqrt{X_r}} \quad (i),$$

where $R(x)$ is a rational function of x. Prof. Chessin gives a practical rule for the integration of (i).—Certain classes of point transformations in the plane, by Dr. E. O. Lovett, was read at the May meeting. It is proposed to apply the transformations to plane curves (spirals) in a subsequent note. The properties discussed and the points of view differ sufficiently (in the author's opinion) from the forms discussed by Laisant (*Nouvelles Annales*, 1868, p. 318) to warrant its publication.—Prof. H. B. Newson in a paper, read at the April meeting, entitled "Continuous groups of circular transformations," has for his object the presentation of the outlines of a fairly complete theory of the continuous groups of linear fractional transformations of one variable. His method differs from the methods of Lie.—Dr. C. A. Scott, in her review of "Julius Plücker's Gesammelte Mathematische Abhandlungen" (edited by A. Schoenflies, 1895), gives a very interesting sketch of this first volume, which contains thirty-nine memoirs by Plücker and Clebsch's "Gedächtnissrede" from the sixteenth volume of the *Göttingen Abhandlungen*. From the "Notes" we learn that Prof. Newcomb, the President of the Society, had chosen the philosophy of hyper-space as the subject of his address at the annual meeting (December 29, 1897).—The valuable list of new publications covers a wide field of mathematical work.

Bulletin de l'Académie des Sciences de St. Pétersbourg, 1896, Tome v. No. 3.—Report of the work of the Russian Archæological Institute at Constantinople, by Th. Ouspensky. The chief work of the Institute is the collection and the study of antiquities; excursions to Trebizonde, Samsun, Sinope and Athens were organised for this purpose. A library and a small museum have been opened.—The declinations of fourteen stars which were observed at Pulkova for the study of the variations of latitude at Kazan, by A. Ivanof.—On vinil-trimethylene and ethylidene-

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trimethylene, by G. Gustavson.—Short report of a journey to Novaya Zemlya in 1896, for the observation of the eclipse of the sun, by Prince B. Galitzine. The eclipse observations, as is known, were made under fairly favourable conditions, through a light veil of cirrus clouds. After the eclipse, the expedition made an excursion inland in the high mountain region which covers the island in the north-east of Karmakuly. The excursion lasted only nine days. A glacier, two miles long, was discovered at the head of Karmakulka River; very large *neves* are a characteristic feature of this part of the highlands.

No. 4.—Study of the anatomy of *Acanthobdella peledina*, by A. Kowalevsky (in French), with six engravings.—Report of O. Backlund on his journey to Paris and Odessa, for the unification of the constants accepted in astronomical ephemerides.—On the testing of glycerine and the analysis of wax, by F. Beilstein and R. Rinne (in German).—Note on a dry fog observed in Samara.

SOCIETIES AND ACADEMIES.

London.

Entomological Society, January 19.—Annual Meeting.—Mr. R. Trimen, F.R.S., President, in the chair.—The balance-sheet for the past year, showing a balance in the Society's favour and an improvement in the financial position, was read by Mr. A. H. Jones, one of the auditors. The Secretary then read the Report of the Council, from which it was seen that during 1897 the Society had lost 7 Fellows by death and 5 by resignation, and had elected 24, the total number now on the list being 398. The *Transactions* for the year contained 19 memoirs, illustrated by 11 plates, and extending to 434 pages. As a mark of respect to the late Mr. J. W. Dunning, the Council had decided to present his portrait as a frontispiece to the volume of *Transactions* for 1897. It was announced that the following Fellows had been elected as Officers and Council for 1898:—President: Mr. R. Trimen, F.R.S. Treasurer: Mr. R. McLachlan, F.R.S. Secretaries: Mr. W. F. H. Blandford and Mr. F. Merrifield. Librarian: Mr. G. C. Champion. Other Members of Council: Mr. W. Bateson, F.R.S., Dr. T. A. Chapman, Sir G. F. Hampson, Bart., Mr. M. Jacoby, Mr. A. H. Jones, Dr. P. B. Mason, Mr. O. Salvin, F.R.S., Mr. J. W. Tutt, Mr. G. H. Verrall, and Mr. C. O. Waterhouse. The President nominated as Vice-Presidents Sir George Hampson, Mr. McLachlan, and Mr. Verrall, and his address was then read on his behalf by the Secretary. After briefly reviewing the position of the Society, and referring to the losses sustained by deaths during the past year, especially those of Dr. Fritz Müller, Mr. J. W. Dunning, and Captain E. Y. Watson, the President proceeded to review the subject of mimicry. (An abstract of his address is printed in another part of this issue of Nature.) On the motion of Lord Walsingham, seconded by Mr. F. D. Godman, a vote of thanks to the President for his able and exhaustive summary of the subject, and for his services during the past year, was carried by acclamation.

Geological Society, January 5.—Dr. Henry Hicks, F.R.S., President, in the chair.—On the structure of the Davos Valley, by A. Vaughan Jennings. Evidence was brought forward to show that the level area, about four miles in length, near Davos, is occupied by superficial deposits, and that the lateral talus-fans there have been cut through at a relatively recent date since their accumulation; that the northern end towards Wolfgang is blocked by moraine-material of great thickness, but for which the Davoser See would drain north to the Landquart, carrying with it the waters of the Fluela and Dischma; that the contour-lines suggest the former existence of a far larger lake stretching south towards Frauenkirch, and that in that part there is proof of the previous existence of a great detrital fan sufficient to account for the existence of the lake in question.—Sections along the Lancashire, Derbyshire, and East Coast Railway between Lincoln and Chesterfield, by C. Fox-Strangways. The portion of the line considered in this paper occupies a distance of about forty miles, and runs nearly at right angles to the strike of all the beds from the Lias to the Coal Measures.

Royal Meteorological Society, January 19.—Mr. E. Mawley, President, in the chair.—The Secretary read the report of the Council for the year 1897, showing that there had been an increase in the number of Fellows and that the finances were satisfactory.—The President, Mr. Edward Mawley, then gave an address on weather influences on farm and garden crops, in which he pointed out the intimate connection between meteorology, agriculture and horticulture. He explained the special characteristics of the climate of the British Isles as regards temperature, rainfall, &c. Of all the influences brought to bear on vegetable life by the atmosphere, he considered temperature to be the most powerful and far reaching, and only second to this came rainfall. The leading effects of snow, wind and sunshine, as well as of prolonged droughts, severe frosts and persistent rains, were also described. He then dealt with the influence of different important weather changes on such farm crops as wheat, roots, grass, &c., as well as on fruit trees, vegetables, and flowering plants in the garden. In his concluding remarks he called attention to the great want of experimental farms in conjunction with meteorological stations being established in this and other countries in Europe. For it was only by the examination of meteorological observations, together with weekly records of the extent and character of the growth made by our leading crops, that the close connection existing between weather changes and their influences on such crops could be clearly traced.—Mr. F. C. Bayard was elected President for the year.

Zoological Society, January 18.—Dr. Albert Günther, F.R.S., Vice-President, in the chair.—The Secretary exhibited, on behalf of Prof. Robert Collett, a specimen of a supposed hybrid between the Fieldfare (*Turdus pilaris*) and the Redwing (*T. iliacus*).—Mr. W. E. de Winton exhibited and made remarks on a skin of a zebra from British East Africa, belonging to a form described by Herr P. Matschie as *Equus burchelli böhmi*, obtained by Captain S. L. Hinde at Machakos.—Mr. L. W. Byrne read a paper on the general anatomy of the fishes of the order *Holocephali*. The paper contained a brief account of the anatomy of the soft parts of *Chimæra monstrosa* and *Callorhynchus antarcticus*, and a comparison of them with a typical Elasmobranch such as *Scyllium*.—Dr. W. G. Ridewood read a paper on the development of the hyobranchial skeleton of *Alytes*, in which he showed that of the two axial cartilages present in the larval hyobranchial skeleton of this Batrachian the anterior one disappears completely, while the posterior, which is remarkable in extending back to the laryngeal sinus, persists as the central part of the body of the hyoid.—Mr. F. O. Pickard-Cambridge read a paper on the Cteniform Spiders of Africa, Arabia, and Syria, which contained a list of the species already described from these countries, with notes on their identities, and descriptions of nine new species.—Mr. L. A. Borradaile gave an account of the Crustaceans of the order Stomatopoda represented in the collections made by Messrs. J. S. Gardiner and Dr. A. Willey in several of the South Pacific Islands. Ten species were enumerated, of which three, viz. *Gonodactylus espinosus*, *Pseudosquilla oxyrhyncha*, and *Squilla multituberculata*, were described as new.

Edinburgh.

Royal Society, January 17.—Rev. Prof. Flint in the chair.—Dr. Hugh Marshall read a note on the axes of symmetry which are crystallographically possible. In this paper the author gave a proof simpler than that of Gadolin ("Mémoire sur la déduction d'un seul principe de tous les systèmes crystallographiques avec leurs subdivisions"), namely, that if the law of rational indices be assumed, only digonal, trigonal, and hexagonal axes are possible with crystals. The proof rests on the assumptions, that an axis of symmetry is necessarily a possible edge or zone axis, and that there are possible edges perpendicular to any axis of symmetry, *i.e.* that the plane to which it is normal is a possible face. These assumptions are formally proved, and then the proposition that an axis of symmetry of the nth order is crystallographically possible only when cos $2\pi/n$ is rational, is proved generally. The value of n is limited by the laws of rational indices to those cases where cos $2\pi/n$ is rational. Further, from the nature of an axis of symmetry, n must be a whole number. It is shown by N. Boudaief, in the appendix to Gadolin's paper, that the only values of n which satisfy these two conditions are 2, 3, 4, and 6. Consequently only digonal, trigonal, and hexagonal axes of symmetry are possible with crystals.—Prof. Geikie communicated a paper, by Mr. John S. Flett, on the Old Red Sandstone of the Orkneys.—Dr. R. H. Traquair, F.R.S., had a paper on the fossil fishes of the Orcadian series of the Old Red Sandstone of Scotland. As many as fifty-eight species of fossil fishes had been, up to 1888, named and described from the Orcadian rocks of the Moray Firth area, of Caithness, and

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